Classification

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CRITICISM OF THE Decimal Classification, and particularly discussion of its drawbacks, has proceeded for nearly half a century. The arguments have gone round and round—mainly superficial in content, and all stemming ultimately from a few tentative suggestions from W. C. B. Sayers [1] and a full-dress discussion by H. E. Bliss! [2] Much of the debate was valuable in early years, but as time has passed, and the scheme has been shown to work in spite of its drawbacks, we ought to be able to draw one of two conclusions. Either the volume of criticism has been wrongly focused, or classification is such a powerful tool that even so bad a scheme as the critics would have us believe D.C. to be is of considerable value in organizing knowledge.

The Library of Congress Classification, on the other hand, has been approached with a certain measure of restraint. In the first place, it did not demand any action by the rank and file of librarians; it was of concern only to its operators in Washington, and to young students who, like the foreign pupil of Shakespeare, "anaphrased, paralyzed and pulverized" it. Sayers' criticism amounted to little more than a questioning of the "inconstant repetition" of common subdivisions and geographical divisions, leading to great bulk, and to the charge that there appears to be no natural or philosophical order in the main classes. Bliss gave extensive criticism to this scheme also.

The writer, however, would be inclined to find fault with both systems for a more fundamental reason, and would include in his strictures also both the Bibliographic Classification of Bliss and the Universal Decimal Classification. All of these schemes are enumerative. That is to say, they set out to list specific subjects as they existed, or seemed likely to exist in some cases, at the time of their construction. But it is demonstrably impossible to list all existing subjects even to the moment the author lays down his pen; and the anticipation of future subjects is beyond the power of men. In certain respects

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this was recognized at various stages in the progress of the Decimal Classification; and provision was made to divide geographically by the subdivisions of class 900, or subjectively by appropriate schedules from other parts of the classification, or even by the main scheme itself, and thus to avoid infinite enumeration. Such devices were introduced in successive editions, with the grafting of new ideas onto the old stock, and without rethinking the whole according to the new patterns of knowledge.

Bliss, coming later in the field, was able to take advantage of many new devices, and with his second book [2] introduced the conception of synthetic classification, at least in respect of certain recurrent features of knowledge. Nevertheless, he still adhered fundamentally to the enumerative form, and the praise that was accorded his work echoes the pronouncement "scholarly."

In all these schemes, any considerable advance in knowledge demands revision of the basic schedules by the author. None of them grows by itself, save insofar as the tables of constants, i.e., geographical tables, linguistic tables, and common subdivisions, provide for this. Yet the recognition of the need for such tables ranging over wider fields than place, time, language, and form is growing—except, in a limited way, in the Library of Congress scheme. This is evidenced by the provision for interrelation between subjects provided for in the Universal Decimal Classification, and by the new Metallurgy schedules,[3] which are built on the principles of allotting numbers to certain processes wherever they appear.

This greater preoccupation with the thoroughgoing control of knowledge springs from the demands of scientific and technological libraries which are concerned with that part of knowledge which is growing most rapidly. Classification as a library tool sprung up with the development of the public library movement; but what was an adequate tool for the small public libraries of the early twentieth century has proved quite unable to cope with the demands of research and industrial libraries of later years. The Universal Decimal Classification, which set out to meet their requirements, falls deeper and deeper into the morass of involved construction, extravagant use of notation, and ambiguity. As for the Decimal Classification itself, the fifteenth edition [4] seems to indicate that it has quite given up the struggle to control knowledge. It seems to be settling comfortably back into the routine of meeting the comparatively simple demands of the small-town American library, leaving the real task of organizing knowledge

to the dictionary catalog, and contenting itself with providing a means of assembling books on the shelves.[5]

This leads to an enunciation of the three levels at which a librarian may use classification in his daily work:

1. As a convenient method of assembling books on shelves, and for arranging pamphlets and clippings in vertical files.
2. As a basis for systematic organization of knowledge in catalogs and bibliographies, classification being employed to show the more permanent relations between subjects, alphabetical arrangements to indicate others, including authorship.
3. As a discipline in reference service, to enable the librarian to sort the wheat from the chaff in a subject inquiry, and to handle a question with maximum efficiency.

In the United States the concept of classification seems, in the main, to halt at the first stage, due doubtless to the numerical preponderance of small-town libraries there, and also to the failure of Decimal Classification to measure up to the demands of large libraries in universities and colleges. In Great Britain the greater interest of the profession in classified catalogs has led to a fairly general acceptance of the second stage. This is reflected in the demand of the national scheme of certification, conducted by the Library Association, for an understanding of the construction of the classified catalog by "competent practising librarians."[6] It is significant that when the Library Association, in collaboration with the British Museum and other institutions, promoted the *British National Bibliography*,[7] it went without saying that the bibliography should take the form of a classified catalog. The third stage of classification is only glimpsed here and there, although all good librarians use it intuitively. S. R. Ranganathan refers to it in his *Classification and Communication*, while D. J. Foskett[8-10] of the Metal Box Company, England, has touched upon it as an important bibliographical discipline.

As long as discussion of classification continues to be based only upon an appreciation of its use at the first stage, it will remain largely abortive. There are no more problems to discuss in respect of "books-on-the-shelves," and not sufficient demonstrably solid advantages to make it worth all the trouble of overcoming inbred prejudices. There even seems to be a school of thought arising in the United States which favors a return to *numerous currens*, plus bigger and better dictionary catalogs! This, of course, only passes on the problem of

organization of knowledge to the catalog; for readers must have the benefit of systematic order, and this is achieved or sought through the "pyramid of references," [11] which itself derives from a hidden classification of knowledge. In the case of Sears' list of subject headings, the hidden classification is an early edition of Decimal Classification, as comparative examination will show.

If the use of classification is to advance from the primary to the secondary or tertiary stage, a far more advanced type of classification scheme is required. All indexing must refer to something, if only the pages of a book. The smaller the unit to which reference can be made, obviously the more detailed the indexing will be. When indexing the subjects in a catalog, it is necessary to have every major aspect of a subject represented in the notation, in order that the alphabetical index, by picking up each digit of the notation, may overlook nothing of importance. Any attempt, therefore, to set arbitrary limits to the number of symbols to be used in a classified catalog necessarily restricts the penetration of the alphabetical index. This is a warning against trying to organize knowledge through any simplified arrangement, whether of classification or of subject headings.

In this brief review of criticism of the major schemes, no attempt has been made to rehearse the familiar arguments. As can be seen from *Library Literature* too many papers have already been devoted to the failings of Decimal Classification, which is the most widely used plan. Indeed, it has been said that to many librarians classification and Decimal Classification are synonymous. The more fundamental work of Ranganathan, to which an attempt has been made to provide a simple introduction recently,[12] supplies a sharper set of criteria upon which to base criticism of any scheme of classification.

Having taken cognizance of the great volume of criticism which has been expended upon the Decimal Classification over the last half century, one is naturally led to wonder what the effect has been on the widespread use of the plan. The answer is, as far as public libraries are concerned, very little. There is small evidence that criticism has resulted in action, except in American university and college libraries, which have swung over to the Library of Congress Classification in the last quarter century. Out of 6,000 libraries in the United States, only 213 were classified in 1940 on the Library of Congress plan,[13] and it is fairly safe to assume that no other scheme has been favored in this way, so that Decimal Classification still holds the field.

Yet one must not be too hard. Admittedly it is possible for the

captious critic to refer to the "vested interest of sloth"; but few librarians are in the happy state of having more staff than immediate needs demand, and, though the task of reclassifying is not itself insuperable, the burden of consequential revision of the catalog is sufficient to daunt the bravest innovator. The only workable method is to fix a deadline when the new scheme will come into effect, classifying and cataloging all new books in accordance with it, and reclassifying and recataloging the *live* older books on their way back from reader to shelf.[14] To what an unendurable age of manipulating two sequences this would condemn a library staff! In the writer's own experience, with quite a small bookstock (some 35,000 volumes) the task spread out over years, despite hours of voluntary overtime worked by a library staff on standby for air raid precautions from 1939 to 1941.

The picture remains much as it was in 1938, when over 90 per cent of American and British libraries used Decimal Classification. There is one new feature to be observed, namely, the growing use of the Bibliographic Classification of H. E. Bliss. In the newer countries, where no entrenchment of the Decimal Classification existed to bedevil the new librarians, the more modern approach of the Bibliographic Classification has attracted a number of adherents. In New Zealand, Otago University has adopted the scheme, and in Africa it is in use at Ibadan University College, and at the Gordon College in Khartoum; Kumasi College of Technology also employs it, as does the Public Library Service of the Northern Region of Nigeria. Note that these are mostly university and allied libraries. Here the scholarly approach of Bliss, whose work is claimed to be based upon educational and scientific consensus, as reflected in the university syllabus, proves very attractive, and not unnaturally. It is significant too that in Great Britain, where the Institutes of Education (often attached to the universities) are late-comers in the field of provision for libraries, this scheme has been chosen in a number of instances. Certain British polytechnics and other training colleges have succumbed to its lure, and at least one British government library—Ministry of Health—has adopted it.

Why the Bibliographic Classification? Probably because the cumulated criticism of many years has led librarians to look elsewhere than to Decimal Classification when forming new libraries, or classifying old ones for the first time. Because, too, the basic plan of the Bibliographic Classification is more in line with modern thought than

that of Decimal Classification. And because basically it is similar in design to Decimal Classification.

The Library of Congress Classification also has had its conquests in Britain, notably among governmental libraries (e.g., Board of Trade, Ministry of Transport). Here the reason is not far to seek. The extremely detailed schedules, and their sectional revision and publication, make this scheme relatively easy to apply, once the decision to do so has been taken. Such a decision may be influenced, too, by the availability of the Library of Congress catalog cards.

The main schedules of both of the foregoing plans are enumerative in form, and do not demand the fundamentally different approach required by the Colon Classification,[15] which is the only other contemporary general scheme. One should add, however, that awareness of the Bibliographic and Congress schemes has been a long time growing, while knowledge of Ranganathan's work is a postwar, and still rare, phenomenon in the West. It is too much to expect it to have met with wide adoption yet.

Nevertheless, the underlying concept of Colon is more in line with the needs of a changing society than is the case with any other library classification. It steadfastly refuses to "fix" at any stage the specific subjects that together make up knowledge. Beyond listing the fundamental constituent parts of each major subject, and providing geographical tables and common subdivisions, it enumerates nothing—except Indian literature, which is "worked out" as an example. It implicitly recognizes that in enumeration lie the seeds of decay of any classification, and that as far as there can be a truly permanent scheme, it must be one which is potential, and never reaches finality. Colon Classification does not accept the permanence of any piece of knowledge, but gives hospitality to all theories, hypotheses, or guesses at the answers to problems, without elevating any of them to a more lasting place than is justified by the output of literature concerning it. If there is no literature there is no number.

The particular contribution of Ranganathan has been his idea of fundamental categories. He contends that if one goes beneath the surface of specific subjects he finds them made up of parts which correspond to the five fundamental divisions of Personality, Matter, Energy, Space, and Time. Certainly, choosing a simple example of human activity such as "Furniture Making," one can say that in order to fashion a certain item or part of an item of furniture, one must take raw materials and work upon them in a given place at a given time.

One might also claim that in describing such activity one would necessarily write about the parts or kinds of furniture, the materials of which it is made, the manufacturing operations, the place or the time of production, or about complexes of any two or more of these. If this is so, a classification which is to reflect knowledge accurately would need to allow for these categories. Colon Classification follows such a pattern, each of its main classes being considered to have five compulsory facets corresponding with the five fundamental groups. It is debatable whether this pattern can be traced through the natural sciences,[16] without postulating a "quarry" of entities upon which man works by study or analysis, to produce the "personalities" of the various pure sciences. But that is beyond the scope of the present paper.

This is fundamentally the same idea as occurs in the work of Mortimer Taube in the United States. He writes of coordinate classification in Jesse Shera's and Margaret Egan's *Bibliographic Organization.*[17] It is the idea that specific subjects can be broken down into simpler terms, which are susceptible of more detailed indexing, and which themselves fall into various categories. B. C. Vickery, in Great Britain, has dealt specifically with this point in an unpublished paper.[18]

Depth-classification, which is the name given by Ranganathan to the very minute kind of classification needed for documentary work, often demands subsidiary divisions in any given category in addition to those normally provided. Hence we find Colon Classification allowing "optional" facets for documentation, in addition to the compulsory ones provided for book-level classification. Thus an effort is made to meet the special librarian's needs by placing the development of any class or subject in his hands. In the major schemes, the special librarian finds the subdivision far too minute everywhere except in his own field; there it is never sufficiently minute. Colon Classification seeks to provide a general scheme which can be developed by the user at any point and to any degree desired. In this way its author aims to match the exact requirements of every library for close classification.

Indeed, the major contribution of Colon to classificatory science is its demonstration that the autonomy which Decimal Classification and the Bibliographic Classification give in their tables of geographic constants can be extended to other areas of subject division, via the faceting method of construction. Such a method demands a notation which matches it in flexibility, and this, too, is provided. The research of Ranganathan in this connection has been considerable.

Apart from the recognition of internal relations between the parts

of subjects, Colon provides ample means for taking into account external relations between different branches of knowledge. These Ranganathan calls "phase-relations," and he is at present pursuing inquiries into their different kinds, and into methods of controlling the records of them. They form an increasing part of monograph literature in an age of rapidly expanding knowledge, for more and more we find the research in one field of human activity throwing light on work in a hitherto unrelated field.

There is no pretense on the part of Ranganathan and his followers that classification ever can represent knowledge wholly and in all its complexity. The multidimensional nature of it cannot be fixed, because we can only cope with it item by item—that is to say, in a unidirectional manner. The problem of classification is, therefore, to reduce many dimensions to one, and yet to make any part of each truly accessible. The trellis-work of Colon imposes a pattern on knowledge, just as any other scheme does; but the pattern is a communicable one, not the private process of one mind. Once the scheme has been learned, the day-to-day classifier takes on the constructive function of the maker, and can build a plan for his own private area of interest which will use the same type of notation and same mode of construction as the general one. This coordination with a general scheme frees the "local man" from the task of having to devise properly helpful numbers ranging over the whole field of knowledge for his fringe-topics, since the general plan is available to him as a quarry from which appropriate numbers can easily be drawn.

If Colon is not, in its present published form, ready for early adoption in the West, as some declare, it nevertheless has earned its passage by the light it has thrown on classification. No longer can the skeptical claim that classification theory is a few odd and unrelated pieces culled from ancient logic and modern makeshift. Today there is a well-reasoned hypothesis, which takes account of all the facts known, but which can be adjusted if experimentation and new facts throw it out of gear. Today there can truly be said to be a science of classification on which research is proceeding in India, Britain, the United States, and possibly elsewhere.

In India, Ranganathan himself conducts the research work at Delhi University, aided by a group of enthusiastic young fellow countrymen. The results of his work reach us from time to time in tentative typescripts circulated among friends, and, later on, as published articles in *Abgila*. This periodical, published by the Indian Library Associa-

tion, is an assemblage of research and news; and it is a goldmine for advanced classification students.

In Britain, too, there is some interest in such research, largely inspired by Ranganathan's work. Led by Vickery and A. J. Wells, a small group of librarians meets for occasional discussion and circulates papers. Perhaps it soon will get beyond the discussion stage and proceed to practical proposals.

In the United States, interest in classification is active. Certain names spring to mind in connection with the subject. There are Jesse Shera,[19, 20] of the School of Library Science, Western Reserve University; Maurice F. Tauber, of the School of Library Service at Columbia University; and Mortimer Taube,[17] formerly of the U.S. Atomic Energy Commission, and now of Documentation, Incorporated. Doubtless there are others who are thinking and experimenting in classification, but have not yet committed themselves to print. The challenge of advancing technical and scientific knowledge is probably felt more in America than any other country, with the possible exception of the U.S.S.R. Some of the papers presented at the institute [21] held in June 1952 at Columbia University give an excellent reflection of the interest this subject is provoking in the United States.

Colon, however, is not the only scheme which now uses faceting as a means for achieving a closer relationship between classification and knowledge. As has been mentioned earlier, Universal Decimal Classification has introduced the principle into its Metallurgy schedules, published in 1949. Here there are two facets provided for, Metals and Processes. In Ranganathan's terminology these represent the Personality and Energy categories. It is highly probable that the introduction of this method of division was quite independent of Colon. The idea of "categories" is in the air.

Recognition of the advantages of faceting is likely to grow in the coming years. Within a week of the present writing, a review of a new classification [22] in a specialized field had appeared in the *Library Journal*. Examination of the scheme shows that its schedules fall quite clearly into the five fundamental categories enunciated by Ranganathan, although at first this is obscured by the notation. The main divisions are given alphabetical symbols, and divide into three distinct groups, the second and third of which correspond with Energy and Personality. The author has obviously been influenced by Ranganathan's ideas, even if he has not followed his practice. His preface indicates his indebtedness.

Wherein lies the peculiar advantage of a faceted classification? Possibly it is in the fact that the enumeration is restricted to more fundamental and, therefore, possibly more permanent concepts than the complexes of activities and things that make up specific subjects. In Packaging,[23] for example, the Material facet lists kinds of materials used, and the Energy facet lists operations, unrelated to any particular material; thus at no time are the lists out of date, because no subject gets a number until the library has some material about it, and, equally, the number drops out of existence when the subject ceases to attract literature.

We come now to consideration of a new phenomenon in the field of research: the introduction of coding devices to make possible the use of punched card and other searching machinery. Basically, the idea is to represent a piece of information by the position of a hole punched in a card, the card being endorsed with that information. A machine which "feels" a series of cards and picks out those with a given punching recaptures the recorded information at will. Accurate and sensitive mechanisms enable the searching to be done at very high speed, as indeed is essential, since the whole series of cards has to be gone over for each inquiry. There are also electronic devices, but fundamentally the process is the same—storing and rapid finding by some coding device.

Now if an enumerative scheme of classification is employed for coding purposes, it registers information only under its dominant facet, and provides no automatic method of selecting further data scattered under distributed facets. An example might make this clearer.

In Agriculture, Propagation Methods is a focus in the Energy facet, while Potatoes, Tomatoes, and Onions are foci in the Personality facet. A general work on propagation methods offers no problem in classification, for it goes with the Energy facet numbers; but works on methods of propagating potatoes, methods of propagating tomatoes and methods of propagating onions all offer two possible placings—under the crop concerned, or under the operation. Good practice would put these under the crop; but this results in distributing some specialized material about propagation methods up and down the crop schedules. Equally, placing under propagation methods would result in scattering all except the most general information about any crop up and down the farming operation schedules. In either case, an enumerative scheme cannot exhaustively provide for all such dis-

tributed facets, and if it does not provide for them it cannot exhaustively code them. What is not coded in the searching machinery cannot be selected by the machine, so that whichever way an enumerative plan displays its information, its distributed facets get obscured.

The faceted type of classification, however, being built upon the principle of separate facets bound together in a predetermined manner, is able to code the foci of each facet separately. Thereafter, no matter where a focus turns up, it can be found by the searching apparatus, because its design meets the needs of such apparatus. Here is an example of a distributed facet drawn from the index of the *British National Bibliography*.[7]

Timber:	Building construction	694
	Building materials	691.1
	Forestry	634.98
	Manufactures	674
	Manufactures: Economics	338.47674
	Trade: Management	658.974

This gathers under Timber all the works scattered in various parts of the classification by the more dominant subject relation. Only a faceted scheme gives the fullest facility to an index for doing this, and the same facility is required for coding. A monograph on classification and coding for search has been published by Unesco.[24]

Rereading this essay, the writer finds that Colon comes out of it better than all the other devices. This was not intended when the essay was planned, but it undoubtedly reflects the writer's outlook. It is not suggested that Colon is a finished scheme ready to go into action at the drop of a hat; no one is more aware of its inadequacies than its author. Nevertheless, its enormous value in making possible an advance in critical understanding of classification, and of revealing ways of improving even existing schemes (cf. the adoption by Universal Decimal Classification of octave notation in 1948) would alone justify its existence. This, however, is not its only recommendation; it definitely goes much nearer to the control of recorded knowledge than anything yet.[16] The western world has not paid enough attention to the analytico-synthetic kind of classification, of which Colon is the prototype, and we still get systematic tabulations of specific subjects offered as classifications.

Perhaps the most useful valedictory for a paper of this nature is to urge that the groups working on classification in the various coun-

tries should come closer together. An international circulation of the many unpublished papers, which at present are exchanged among friends, might be organized. Possibly, when we are all a little further advanced and know more clearly where we are going, we might even get some personal contacts on an international basis. Would it be too much to hope that an American specialist in classification should come to Britain on a Fulbright scholarship when the time is ripe? One of the most valuable products of the Anglo-American library alliance was the *Rules for Author and Title Entry*. This standardized practice throughout the English-speaking world. It is time we pooled our resources in classification theory.

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